

Architectural Program

Dyche Hall – Seventh Floor Partial Renovation & Exterior Restoration

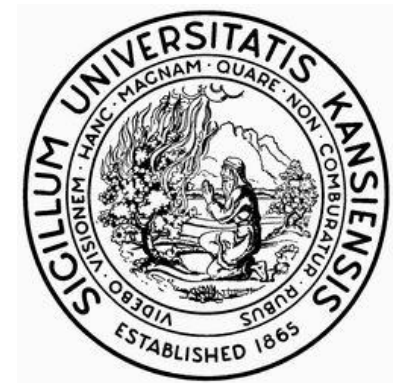
KU Project No. 005-10364

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Prepared by:

The University of Kansas, Lawrence Campus

Office of Design & Construction Management



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Introduction

Dyche Hall was constructed in 1903 to house the wildlife collection amassed by Lewis Lindsay Dyche and to provide educational spaces for the program that has grown to be the Biodiversity Institute.

There have been multiple complaints over the last several years from occupants, particularly of seventh floor spaces, reporting poor thermal comfort and allergic reactions in various areas of the space. Increasing prevalence of these complaints is likely due to several factors, including: this building was constructed long before modern climate control criteria and techniques; evolving occupants' use of the building, as well as their needs and expectations, over time; and the building envelope experiencing significant aging with resulting deterioration of structural components, finishes, and supporting utility infrastructure.

The University has responded with a series of progressively more detailed investigations, assessments, and studies aimed at determining how the condition of certain building elements, (such as the envelope that encompasses the space and the mechanical equipment that heats, cools, and ventilates the space) may be contributing to the poor quality of the occupants' environment.

The executive summaries of two of the assessment reports are attached to this program. The full reports are available for review.

Space Description

The limits of this program scope comprise the southern two-thirds of Dyche Hall, excluding both the north 1963 addition and the west 1994 addition. Project work anticipated for the interior comprises the seventh floor, south wing, within the original building completed in 1903. This space, approximately 8,400 gross square feet, currently houses bird and mammal collections for KU's Biodiversity Institute, as well as research professionals that study within the Biodiversity Institute. Space functions include offices for researchers and graduate students, the Biotic Analysis Lab and GIS computing lab, and the previously mentioned research collections of birds and mammals.

There are 6 main functions on the 7th floor:

- Collections: 4,430-sq.ft.
- Open Office: 1,480-sq.ft.
- Private Offices: 2,000-sq.ft.
- GIS Lab: 1,620-sq.ft.
- Biotic Analysis Lab: 1,015-sq.ft.
- Conference Room: 500-sq.ft.

Figure 1: Current 7th Floor Space Layout identifies the footprint of the proposed project work area and illustrates the relative locations of the 6 main function areas.

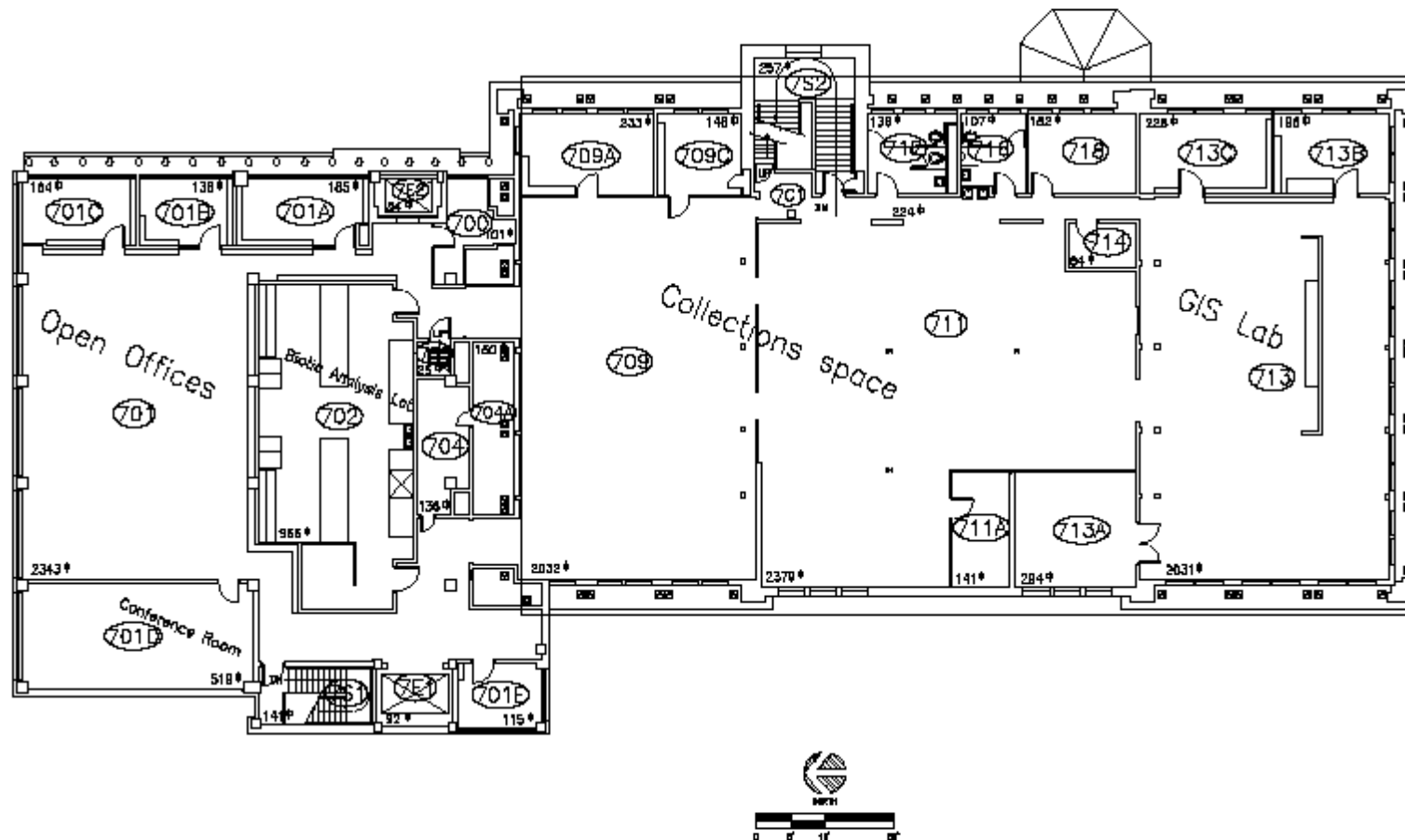
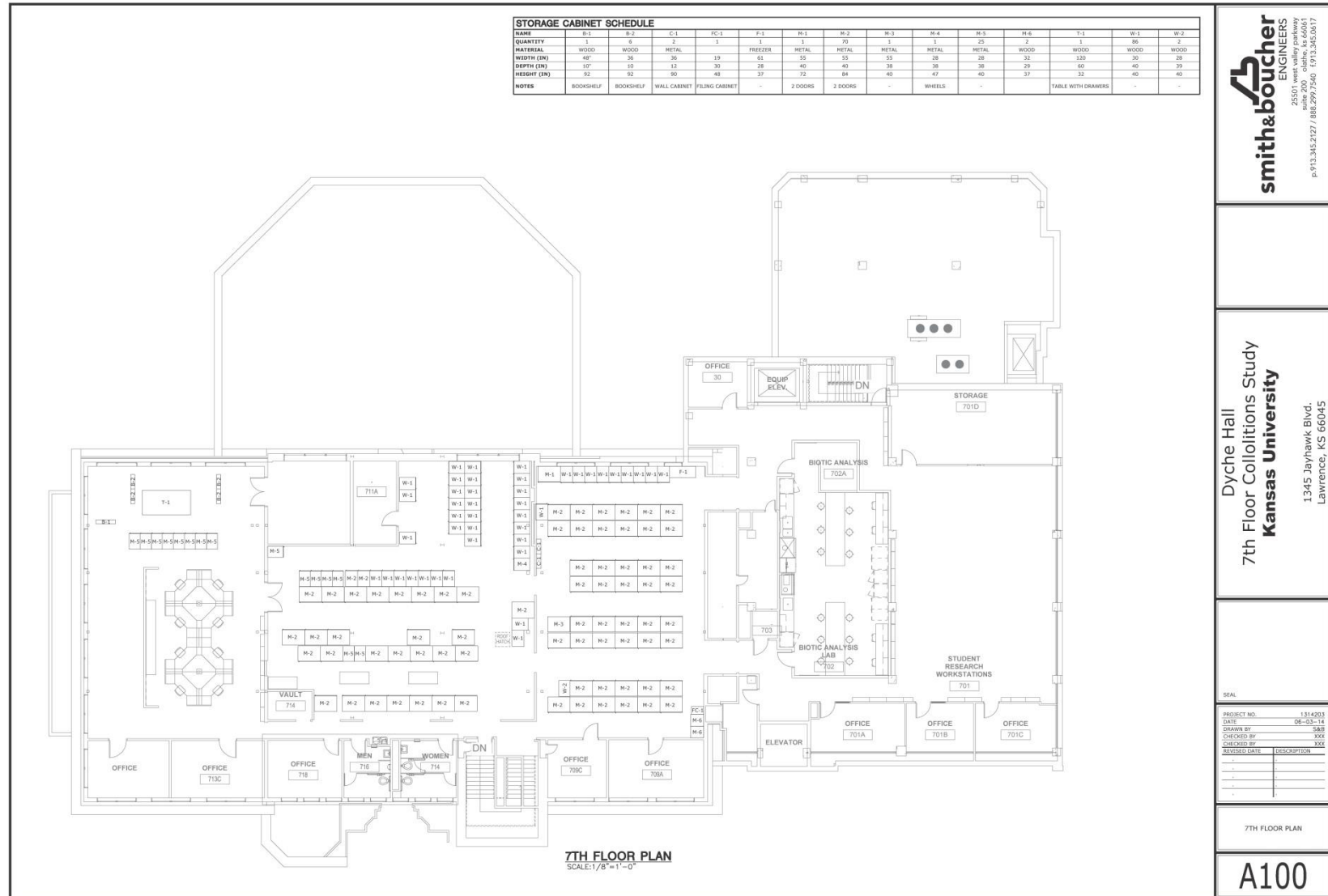


Figure 1 - Current 7th Floor Space Layout



Project Overview

As stated in the program introduction, the original impetus for this project was the need to identify and correct conditions causing occupant complaints of poor working environment in an area of shared collections storage and researcher office space, seventh floor of the 1901 building wing.

At the outset of investigations, primary focus was on the performance of the HVAC systems that serve this space. Among the most noticeable and readily measurable characteristics of the environment are space temperature and relative humidity, as well as space pressurization gradients between adjoining spaces. Ongoing monitoring revealed unacceptable swings in the values recorded for each of these variables and apparent inability of the mechanical systems to control within acceptable ranges.

As the investigation efforts moved from documentation of space conditions to evaluation of options for correction, the assessment of the contribution of building envelope deficiencies to poor building performance was more fully explored. Ultimately it was determined that a holistic solution that involved correction of both building envelope and mechanical system deficiencies would present the best opportunity for creating a healthy working environment for the occupants of the 7th floor space. The Space and Program Needs section of this program identifies the specific deficiencies that have been determined to be contributing to the poor 7th floor environment and proposed work tasks for correcting these deficiencies.

While the scope of work described in this program is intended to result in specific improvements to the 7th floor occupied spaces, a broader and overarching objective is the thoughtful preservation of the historic materials that comprise the exterior of the building. As stated in the roof/exterior wall assessment report:

Since Dyche Hall is listed as significant for its architecture, the character defining features of the building are of particular interest. Character defining features are those items that make a building uniquely identifiable. Just as hair color or freckles make faces identifiable, so too buildings have features that contribute to their identity. The overall form of Dyche is recognizable. But the manner in which the form is finished – full of texture, detail, contrast and reveal makes many of the exterior features of the building character defining.

The consultant team that seeks to complete this program scope of work successfully must be aware that all design and scope of work recommendations must conform to the Secretary of the Interior's Standards for Treatment, as well as the customary regulatory requirements for building code and life safety, since Dyche Hall is listed on the National Register of Historic Places. Moreover, the work must be approached with an understanding that the project is as much about demonstrating a commitment to long term stewardship of a valuable and unique University asset as it is about resolving an immediate space condition issue.

Project Goals

- Goal #1 – an early and significant deliverable requirement of this project is the development of revision 0 of an Historic Structure Report (HSR). The University anticipates that this HSR will be developed per the guidelines of the US Dept. of Interior National Park Service Technical Preservation Brief No. 43 – *The Preparation and Use of Historic Structure Reports*.

Note that the term rev.0 is used in this context to indicate that the University envisions this HSR as a living document to be re-visited, revised, and updated as the structure's condition and environs change and as the programmed use of the structure changes.

With regard to this capital project, the referenced preservation brief includes the following bullet points that are expected to have particular relevance in completion of this project, and which are primary justifications for developing a Dyche Hall HSR :

- To serve as the primary planning document for decision-making about preservation, rehabilitation, restoration, and reconstruction treatments.
- To serve as a guide for budget and schedule planning for work on the historic structure.
- To establishing a basis for design of recommended work.
- To serve as a readily accessible reference document for owners, managers, staff, committees, and professionals working on or using the historic structure.

Appendix A - *Historic Structure Report – Key Components* presents a checklist outline of work tasks that the University anticipates will be included in the preparation of the HSR.

- Goal #2 – Develop a multi-year, multi-phased project to correct deterioration and deficiencies identified in the April 2015 *Tile Roof & Exterior Wall Condition Assessment Report*.

Note that it is key to success of this project that the scope of work developed to satisfy goal #2 includes modifications to the building envelope that are consistent with recommendations for correcting deficiencies identified in the July 2014 *Facility Assessment Report*.

- Goal #3 – Develop a project of interior renovation of 7th floor spaces to eliminate the current poor environment of 7th floor occupant spaces.

Note that it is key to success of this project that there is consensus among key stakeholders as to the validity of contents of the HSR document described in goal #1 prior to development of a schematic design to satisfy goal #3.

- Current program use of space should be confirmed or modified.
- Owner Project Requirements (OPR) should be confirmed or modified based on revised user input or modified space programming.

Also critical to success will be creating design details for the restoration of the building envelope as part of goal #2 with a priority of limiting heat and moisture transfer so that Owner Project Requirements are achievable.

Space and Program Needs

All of the proposed work will be completed within the existing building footprint. No additional interior space requirements are anticipated. No changes to the current facilities programs are anticipated.

Proposed improvements include the following items, which will be prioritized as necessary according to funding availability:

Roof System and Exterior Wall Restoration Tasks – Scope items associated with restoration of the building structural and architectural finish elements will be guided by the analysis presented in the April 2015 *Tile Roof and Exterior Wall Condition Assessment Report*. Report recommendations are contained in the Condition Summary Tables within that report. Those tables are included in this program as appendices.

The exterior repair work package is envisioned with fixed scaffold in place. This is not only to facilitate access for the multiple trades involved but to alleviate access issues created by topography and landscaping around Dyche Hall.

Building Envelope Scope of Work:

The scope of work of this project includes improvements to the exterior envelope. The improvements are expected to result in better and more stable control of the occupant environment within the 7th floor space that is the focus of this project.

Completion of this work is also critical to minimizing further deterioration of the exterior elements of the building.

Minimum work elements of exterior envelope improvements include the following:

Roof

- Substrate repairs
- Tile replacement
- Membrane replacement
- Roof drainage replacement
- Soffit and fascia repairs

Architectural Interior

- Vent roof
- Insulate roof
- Restore original ceiling line
- Repair windows

Walls

- Limited stone replacement
- Mortar / sealant joint replacement
- Flashing repair
- Stucco repair
- Repaint cast iron

Additional work elements that should be evaluated within the schematic design portion of this project include:

- Replacement of tile roofing at the pediments, entry, tower, and bay projection
- Replacement of (rather than resealing) 7th floor windows
- Insulating and replacing interior finishes of the framed walls
- Documentation and removal of the grotesques on the building exterior
- Enclosure of the collection to separate it from the office spaces

HVAC System Modification Tasks – Scope items associated with modifications to the HVAC system that serves this area are the result of findings contained in the July 2014 *Facility Assessment* Report.

Each of the following items shall be addressed as part of this scope of work, prioritized with the Owner along with other project needs, to fit within the available funding.

- Rooftop unit does not have active controlled dehumidification capability.
- Rooftop unit does not have humidification capability.
- Common return air is pulled through spaces before it gets to the unit.
- Water from the mixing box section of the unit has leaked onto floor through the return air inlet.
- Chilled water and steam piping is routed through and above collections.
- Piping to the unit has condensed in the past and leaked onto the floor.
- Unit is oversized for the space it currently serves.
- Unit is attempting to condition a space that has limited insulation and no vapor barrier.
- Space pressurization is not effective or accurately controlled. As the outside air damper on the unit is closed to attempt to manage humidity, the floor pressurization goes negative and pulls air from other spaces and from exterior.
- Code-required ventilation air is not provided to the spaces.
- The Collections space has no exhaust associated with it to remove contaminants/particulates or smells/off-gassing from the collections. Recirculated air has no enhanced filtration.
- The Biotic Analysis Lab exhaust fan is in poor condition.

Owner's Project Requirements (OPR)

Relative to the 7th floor interior space renovation, for the HVAC scope of work, the following design criteria are to be used as the basis for design:

- Collections
 - Temperature Range: 66-70°F
 - Summer Humidity: 35-45% (limited swing in 24-hr period)
 - Winter Humidity: 5-50% (active humidification is not required)
 - Capability for active dehumidification
 - MERV13 filtration for outside air and HEPA filtration on recirculated air
 - Ventilation: 10-15 Air Changes per Hour (ACH)
 - Ducted return air to ensure space air mixing is limited
- Office & Support Spaces
 - Temperature Range: 70-75°F
 - Summer Humidity: 35-55%
 - Winter Humidity: 5-50%
 - Capability for active dehumidification
 - Humidification not required
 - MERV13 filtration for outside air
 - Ventilation: 10cfm per person + 0.18cfm/sf (ASHRAE 6)

Acoustics

- Collections
 - NC30
- Office & Support Spaces
 - NC20

Light Levels

- Collections
 - 35-45FC
 - Lights in corridor spaces to be controlled on occupancy sensor.
- Office & Support Spaces
 - 45-50FC at work surface
 - Lights in private offices to be controlled on occupancy sensor.
 - Lights in open office and work areas to be controlled on local switch.

Site Improvements & Infrastructure**Site Improvements**

- As referenced elsewhere in this program, KU seeks to design new buildings that are universally accessible, where feasible.
- With regard to site issues, this program includes only minor site modifications necessary to achieve building entrance accessibility.

Utilities & Infrastructure

- The following modifications or extensions of the utility services to this building are anticipated as part of this work:
 - Depending on the electrical loads resulting from installation of the new mechanical equipment, modifications to the existing building service entrance may be required.
 - Because the current steam utility is being replaced with gas as energy source for the potable water (and

possibly space) heating, a new gas utility service will be required.

Hazardous Materials

The KU Environmental Health & Safety Office will perform tests of existing materials which will be affected by the project work, in order to determine if they are asbestos-containing and to solicit proposals from abatement contractors.

KU's standard policy is to remove all hazardous materials when undertaking major renovations of existing buildings.

Design Standards / Consultant Services

The architectural/engineering (A/E) team shall comply with the latest provisions of the University of Kansas *Design and Construction Standards*, as maintained by the Office of Design and Construction Management (DCM), posted online at DCM's website at: <http://www.dcm.ku.edu/standards>

- The A/E team shall also comply with supplemental updates to these standards which may be issued during the course of the project.
- The A/E team shall comply with KU Audit and Strategic Sourcing guidelines, also posted at the DCM website.
- The Owner's Representative will be a DCM staff person assigned to serve as KU's Project Manager, and who will be the primary point of contact for all communications between the Owner, A/E and Contractor.

- Special Consultants that will be required on the A/E team, in addition to the usual A/E disciplines:
 - Preservation Architect
 - Fire Protection Engineer
- Electronic Files: Consultants shall deliver to KU a complete set of electronic files for all drawings and specs for each design submittal, bid set & as-built documents.
 - Each set of electronic files shall include both PDF and AutoCAD .dwg files for each drawing sheet.
- Physical or 3D/CAD models, if produced by the consultant to explain the design, shall be delivered to and remain the property of the University.
 - Photo-realistic renderings may be required during the design phase to clearly communicate the proposed design options, for both exterior and interior spaces, and for the Owner's use in media distribution, fund-raising and other purposes.
- Program Verification: A/E shall review and confirm all program needs with KU client/DCM, and shall reconcile the proposed project scope with the available funding.
- KU Contracts: Since this project is considered to be non-state funded, A/E selection and contracting will be via University of Kansas processes, using KU's amended AIA contract documents.
- Consultant Scope: A/E team shall design and complete construction documents for base scope and alternate bid/optional improvements.

Code Requirements

- Codes currently used on KU projects include the following:
 - International Building Codes, 2012 edition.
 - Kansas Fire Prevention Code, KSFMO, current edition.
 - ASHRAE 90.1, 2007 edition (plus 30% performance improvement).
 - 2010 ADA
 - Other codes as listed at the State of Kansas, Office of Facilities & Procurement Management – Design, Construction & Compliance (OFPM-DCC) website.
- Code Footprints: Templates of the existing building(s) will be prepared by DCM and furnished to the A/E on DCM's standard 11x17 code footprint sheets.
 - A/E shall update these drawings to reflect all proposed work and submit them for approval to OFPM thru DCM/UFMA, immediately following approval of the Schematic Design phase.
 - Addition or remodeling projects shall evaluate and prepare code footprint drawings that show how the overall facility (existing & new/remodel) will meet code.
 - A/E shall finalize and submit code footprint on a schedule that assures its approval soon after DD approval, and prior to the 50% CD milestone.
 - Electronic files of the approved code drawings shall be forwarded to DCM in both .PDF and .DWG formats.
- Preservation Standards: All project work will be expected to conform to US Secretary of the Interior's Standards and Guidelines, including:
 - Standards and Guidelines for Architectural and Engineering Documentation.
 - Standards for Rehabilitation (36 CFR 67)

- Standards for the Treatment of Historic Properties (36 CFR 68)
- Construction Exiting: It is expected that the 1901 wing of 7th floor work area will be vacated and will be inaccessible to KU staff and the general public during the construction phase of the project. Exiting must be maintained from all other occupied spaces during the construction of this work.
- Fire Sprinkler and Addressable Fire Alarm Systems:
 - Existing Systems: Both fire alarm (FA) and fire sprinkler (FS) systems exist throughout Dyche Hall, including the work area described in this program. The scope of work must include provisions for insuring continued life safety and physical property protection within the work area (and throughout the building) during the project construction phase.
 - System Modifications: Architectural modifications that are proposed for the finished spaces include removal of some non-original fiberboard ceiling panels, thus re-exposing finished trusses that were part of the original building's vaulted ceilings under the 7th floor pitches roofs. As a result, the existing fire alarm and sprinkler systems will require significant re-design within the project work area.
- ADA Compliance: KU seeks to design buildings which are universally accessible and which provide accessibility for all in an integrated, discreet manner.
- Project scope will include all code and ADA-related improvements that are required in order to complete the proposed scope of work, including required ADA improvements along accessible paths of travel to primary function areas.

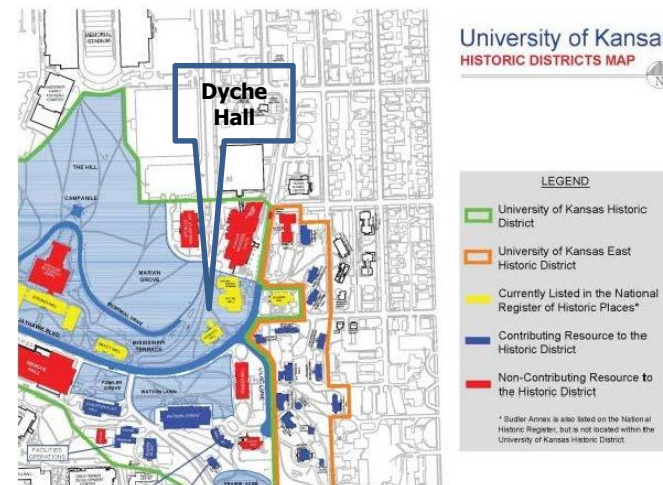
Historic Preservation Reviews

Projects on the KU Lawrence campus that are within a KU building listed on the State or National Register of Historic Places, or within one of KU's Historic Districts, require administrative review by DCM staff or full review by DCM staff and the Campus Historic Preservation Board (CHPB).

The Kansas Legislature repealed the 500' historic environs reviews in 2013, and although the City of Lawrence still requires environs reviews within 250' of properties listed on the City's historic register, KU projects within the City's 250' environs limits are not subject to review if on State property.

A copy of the KU Historic District Map can be viewed online at the DCM website, [KU Buildings](#) page. The City's environs limits can be viewed on the Lawrence [Interactive City Map](#).

Note: This project is located within a listed KU property or within a listed Historic District, so historic preservation compliance reviews will be required, as applicable. Since Dyche Hall is listed on the National Register of Historic Places work recommendations must conform with the Secretary of Interior's Standards for Treatment as well as the usual regulatory requirements for building code and life safety.



KU - City Cooperation Agreement

KU and the City of Lawrence entered into a jointly-beneficial Cooperation Agreement in April 2005. It designated a compatibility buffer zone that extends 150' deep onto KU's property from the primary exterior boundary of KU's property.

Note: This project is not located within the 150' buffer zone, so it does not trigger compliance with these provisions.

Impact on Overall Campus Space

This project is a renovation / remodel of an existing building, and will not add to or remove any space from the University's space inventory.

Annual Maintenance & Operating Costs

Funding for annual maintenance and operating costs will come from existing University resources or new private resources. No new state funding will be required to cover any of these costs.

Proposed Project Delivery Process

Competitive Bid

The University of Kansas proposes to use a traditional but expedited design-bid-build process for this project. The Owner and consultant team shall jointly develop strict pre-qualification criteria, designed to ensure that contractors approved to bid this project have a proven track record of delivering similar projects, under a similar expedited construction timeframe, and successfully meeting those schedules.

Project Budget**Construction Costs**

| | |
|---|--------------------|
| Phase 1 - Roof Repair & Replacement | 1,392,000 |
| Phase 1 - Exterior Repairs | 493,000 |
| Phase 2 - 7 th Floor Interior Renovation | 698,000 |
| <u>Unit Costs Masonry Repair</u> | <u>450,000</u> |
| Subtotal - Construction Costs | \$3,033,000 |

Miscellaneous Costs

| | |
|--|------------------|
| Fees - Consultants, State & KU Agencies | 350,000 |
| Printing, Shipping, Photo-documentation | 25,000 |
| Construction Testing & M/E Commissioning | 30,000 |
| Moving Expenses | 15,000 |
| Infrastructure Renewal Fee | 40,000 |
| <u>Bidding & Construction Contingency (7%)</u> | <u>207,000</u> |
| Subtotal - Miscellaneous Costs | \$667,000 |

Total Estimated Project Cost **\$3,700,000**

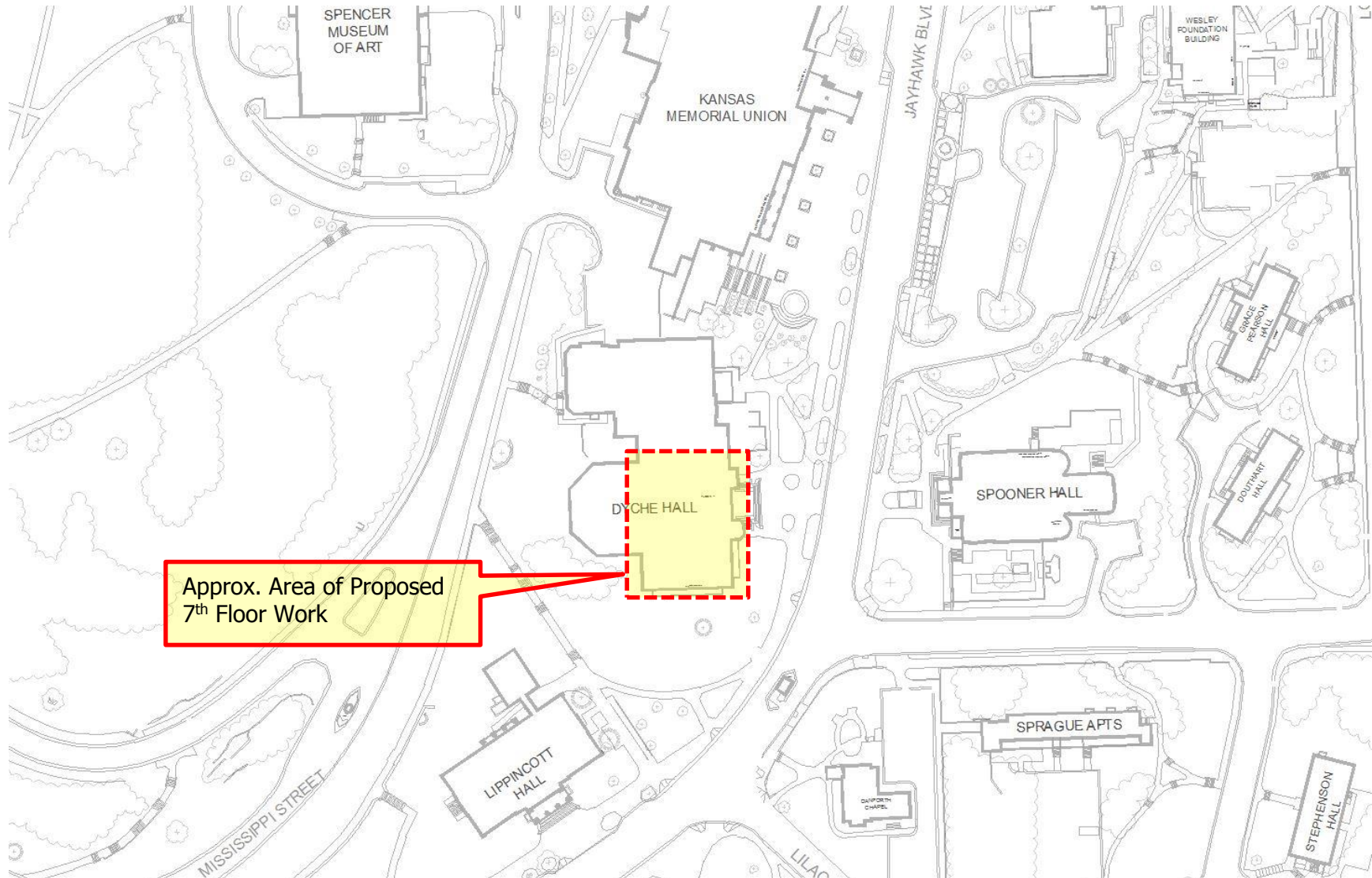
Notes:

- 1) *Project funding is proposed to come from a combination of R&R funds and KU Center for Research funds.*

Project Schedule

| | |
|---|-----------|
| KU Capital Projects Council Review & Approval | Jan. 2016 |
| Joint Legislative Committee on State | |
| Building Construction Review | Jan. 2016 |
| A/E Selection | Mar. 2016 |
| Negotiate Fees / Start Design | Mar. 2016 |
| Finalize Rev. 0 – Historic Structure Report | July 2016 |
| Submit SD w/ Code Foot Print (3 mos.) | Oct. 2016 |
| Submit DD (4 mos.) | Feb. 2017 |
| Complete CD's, Submit for Permits (4 mos.) | Apr. 2017 |
| Receive Bids; Award Contract | May 2017 |
| Construction Starts | June 2017 |
| Construction Completion (8 mos.) | Jan. 2018 |
| Move-In & Occupancy (2 mos.) | Mar. 2018 |

Existing Site Plan



Appendix A – Executive Summary of 2014 Facility Assessment Report

EXECUTIVE SUMMARY

Smith & Boucher was contracted by the University of Kansas to provide a comprehensive study into the Dyche Hall, 7th Floor Collections Space. This space houses bird and mammal collections for the University's Biodiversity Institute as well as research professionals that study within the Biodiversity Institute. There have been multiple complaints over the last several years from the occupants regarding poor thermal comfort and allergic reactions in various areas of the space. Efforts have been done by KU-FS, DCM, EHS and several outside consultants to try and identify the main source and cause of the issues. The study and this report was conducted to take a holistic study approach to the current space layout, functions of each space, collections housing, HVAC equipment and operation and building envelope construction.

There were three main goals for the study:

- Review and analysis of all existing space conditions affecting the 7th Floor Collections space as it relates to collections preservation and occupant comfort.
- Conduct a collaborative, holistic review of the space considering all aspects of the operation (architectural, structural, envelope, functional, environmental).
- Review all spatial conditions as they relate to habitation, collections, security, structural integrity and contamination.

The study was conducted by Smith & Boucher and Treanor Architects with input from Mike Russell of KU-EHS, Gary Lawson of KU-DCM, Bob Rombach of KU-DCM and Lori Schlenker of the Biodiversity Institute.

The study entailed the following tasks:

- Conduct full investigation into the original construction and various renovations that have impacted the physical space.
- Conduct investigation into the original and current HVAC system serving the space.
- Install temperature/humidity loggers in the space and inside the collections cabinets to track and analyze the current space conditions relative to changing outside air conditions. Loggers will be installed for a period of 1-3 months to allow for maximum monitoring period during the study.
- Review current and future space requirements with the user group.
- Review current collections storage strategies and investigate other options for storage.
- Review current operational procedures with the user groups to understand flow and process for the collections.

KU Dyche Hall, 7th Floor Collection Space
KU Project No. 005/10364
Executive Summary-1



A – Executive Summary of 2014 Facility Assessment Report**EXECUTIVE SUMMARY**

- Conduct analysis of the existing envelope and provide options for improvements.
- Review current and potential exiting options to coordinate with potential space changes.
- Investigate and provide options for improvements to the existing HVAC system.
- Conduct analysis of existing attic space to review current structural system and any potential degradation that is contributing to the space dust issues.
- Assist EHS with the identification of air quality testing needs of the space. Review previously conducted test results as well as any new tests conducted during the study.
- Development of an Owner's Project Requirements (OPR).
- Development of prioritized recommendations list.
- Development of design/construction budget correlating to the final recommendations.

The study identified that there were five main issues with the current 7th Floor Collections Space:

- The 7th Floor has two different space functions (office/labs and collections) that require different space condition (temperature and humidity) setpoints. Currently, no separation exists between the Collections space and the personnel work areas.
- The envelope construction of the 7th Floor is not capable of properly controlling heat and vapor transfer. The exterior walls have limited insulation and no vapor barrier. The ceiling of the North and South sections of the space has no vapor barrier and limited insulation and is open to the roof on the South end through a louver. The windows do not appear to be thermally broken and multiple leaks exist around the window frames.
- The HVAC system has no capability to actively control humidification nor dehumidification. The space humidity closely tracks the ambient outside air humidity as a combination of lack of control and the envelope issues. Additionally, the HVAC system appears to be oversized due to changes made during a recent renovation.
- Personnel working (or used to work) on the 7th Floor have allergies to the collections and books (dust inside) that are stored on the 7th Floor and no separation exists between the occupants and collections.

A – Executive Summary of 2014 Facility Assessment Report

EXECUTIVE SUMMARY

As a result of the study, there are several levels of recommendations that should be implemented to resolve the current issues:

- Correct the existing envelope issues to limit infiltration, increase insulation and provide a vapor barrier.
- Physically separate the collections from the occupied spaces.
- Provide a dedicated HVAC system for the collections space and modify or replace the supporting space HVAC system.

The implementation of all three recommendations will provide for an environmentally safe space for both the collections and the personnel on the 7th Floor. This route though is certainly the most expensive, but has the best results. From a cost standpoint, there are several items that could be done to limit cost, but will not fully resolve all of the identified issues. These items could be done as an iterative process or as funding becomes available:

- Correct the existing envelope issues specifically in the attic spaces.
- Reseal the existing windows and frames on both exterior and interior.
- Modify the existing HVAC system to provide for reheat at terminal boxes and a limited level of dehumidification control.
- Replace the existing HVAC system to provide a new rooftop unit that has internal dehumidification control and expanded filtration.

Additional detail on the recommendations and estimated construction costs can be found in the supporting sections of this report.

In addition to the physical space and HVAC recommendations noted, there are several operational issues that were noted by EHS, NIOSH and Terracon that should be implemented:

- Develop written standard operating procedures to store, handle and prepare specimens in a manner that minimizes the migration of allergens, such as feathers, into offices or computer work areas where allergic people are working.
- Improve housekeeping on the 7th Floor.
- Utilize N95 filtering facepiece respirators on a voluntary basis.

KU Dyche Hall, 7th Floor Collection Space
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Executive Summary-3



A – Executive Summary of 2014 Facility Assessment Report

EXECUTIVE SUMMARY

- Nitrile exam gloves should be worn whenever handling specimens to minimize contact with shipping chemicals or any uncontrolled biological hazards that may be inadvertently present on the specimens.
- Handle specimens in the ventilated biological safety cabinet or chemical hood in the Biotic Analysis Lab.
- Encourage employees to wash hands regularly, especially after working with specimens.



KU Dyche Hall, 7th Floor Collection Space
KU Project No. 005/10364
Executive Summary-4

Appendix B – Executive Summary of Tile Roof and Exterior Wall Condition Assessment

EXECUTIVE SUMMARY

This report is a continuation of the investigation started during an initial review of the exterior envelope. That initial review was part of the Dyche Hall 7th Floor Collection Space Facility Assessment (KU project 005/10364). The prior assessment and study was undertaken in response to building occupant complaints about humidity and air quality in the 7th floor collection and adjacent office spaces. This scope is being undertaken because the review of the envelope and discussion of potential insulation of the roof and wall required more information about the existing conditions and construction. The 7th floor consists primarily of the ornithology collection and a portion of the small mammal collection. The office and lab spaces that surround the collection conduct research that is intimately tied to the collection.

The scope of this exterior condition assessment was limited to the roof over the original 1901 structure (exclusive of the panorama wing, entry, bay, and the tower) and the exterior facade of the 7th floor that was accessible via aerial lift. For areas that were not accessible by lift, visual observation was used to determine whether or not conditions appeared similar from the ground.

Dyche Hall was constructed in 1901 to house the wildlife collection amassed by Lewis Lindsay Dyche and to provide educational spaces for the program that has grown to be the Biodiversity Institute. The building is listed on the National Register of Historic Places. The building is significant for the distinctive architectural style in which it was constructed and for its association with education. Dyche was a pioneer in exhibiting wildlife specimens in groupings that were representative of the natural environments in which they were found. His exhibit at the Chicago World's Fair in 1893 is the basis for the panorama exhibit which has been on display in the building for over a century and has recently been restored. The tower and roof are distinctive in the campus skyline. The eclectic use of a stone, brick, tile, metal and stucco finishes coupled with the exuberant sculptural carvings are significant character defining features of the facade.

Since Dyche Hall is listed on the National Register of Historic Places work recommendations must conform with the Secretary of the Interior's Standards for Treatment as well as the usual regulatory requirements for building code and life safety.

This condition assessment report is based on visual assessment, non-destructive evaluation techniques (such as sounding masonry), and semi-destructive techniques (cutting holes in interior finishes to reveal construction and condition). Treanor Architects worked on behalf of Smith and Boucher to conduct this assessment. We were assisted by the KU Biodiversity Institute, KU Design and Construction Management (KU-DCM), KU Health and Environment (KU-HE), KU Facilities and



Father and sons sculptors carving the grotesques - courtesy KU Archives

Appendix B – Executive Summary of Tile Roof and Exterior Wall Condition Assessment

Maintenance (KU-FM), Renaissance Roofing and B.A. Green Construction.

FINDINGS

Aerial access provided necessary close observation of gutter, fascia and exterior wall areas. Rope access provided necessary close observation of the tile roof slopes that are not visible from the flat roof area between the hips. This allowed for exterior materials to be non-destructively investigated. This alleviated some concerns noted about the exterior in the previous project, however it also brought to light many conditions that would not have been known prior to undertaking a repair project. The additional knowledge gained through assessment allows the development of appropriate budgets for repairs.

ROOF

Both the tile and membrane roofs over the 7th floor are at the end of their serviceable lives. The assessment revealed that a number of repair campaigns have likely been undertaken on the roof that are not documented. Several of these repairs have used inappropriate materials and detailing, both of which contribute to leaks and to shortened performance life of the installation. Areas of rot and dry rot are anticipated in locations with persistent leaks, such as at the base of the tower. The hip roof areas are not properly vented. There is evidence that the current dormer vents are allowing moisture into the attic and rafter spaces during wind driven precipitation events. The lack of proper venting is likely contributing to deterioration of interior finishes. There is a small amount of insulation in drop ceilings under the hips, which for the north hip is creating a second space that is not vented. The insulation does not meet current recommendations for roof insulation.

Gutters and roof drainage for the building have been subject to partial replacement, but overall the system does not meet current standard sheet metal practices. Wood fascias and soffits as well as masonry below have suffered damage due to the long-term under performance of the roof drainage system.

WINDOWS

Over half of the wall area of the 7th floor wall area is comprised of windows. The existing windows are aluminum replacement windows. The window units themselves are in fair condition and are serviceable for a few more years. While they are difficult to operate and some of the insulated glazing units have lost an effective seal their condition does not warrant replacement of only one floor of windows if budget is a limiting factor. Sealant at all the windows and the window paning is past its service life; a adhesive failure and weather checking are typical at all locations. This condition is a source of air infiltration and does need to be addressed.

WALLS AND FLASHING

The remainder of the wood framed wall is clad with masonry (stucco, brick and stone) or with sheet metal. The stone and brick units are in good condition overall, though some stone units will require replacement. This deterioration is due to under performing gutters and leaks that have subjected the stone to excessive amounts of water. Soiling is evident on the masonry, typically biological growth, though there is atmospheric soiling on the underside of ledges. The mortar joints are deteriorated and open in many locations. The joints exhibit a number of repair campaigns, and some of those repairs are inappropriate in their use of material or installation technique. The open mortar joints in the brick work are particularly susceptible to air and water infiltration. At one of the wall inspection openings daylight was visible through the joints in the wall.

The stucco applied to the walls around the windows exhibits cracks that have been inappropriately repaired in the past using sealant, but there are very few losses in the finish. The largest loss of stucco material is at the mosaic band which originally had a highly textured finish coat. This finish coat is missing or damaged in much of the mosaic band. There is also evidence that the brick insets at the stone piers on the corners of the building once had the same stucco finish as the mosaic band though it is all but gone now.

There is a deep sill at the base of the windows that is flashed with painted sheet metal. The paint is chalking and peeling in some locations. The flashing termination at the bottom directs water onto the brick and wood trim below rather than kicking it

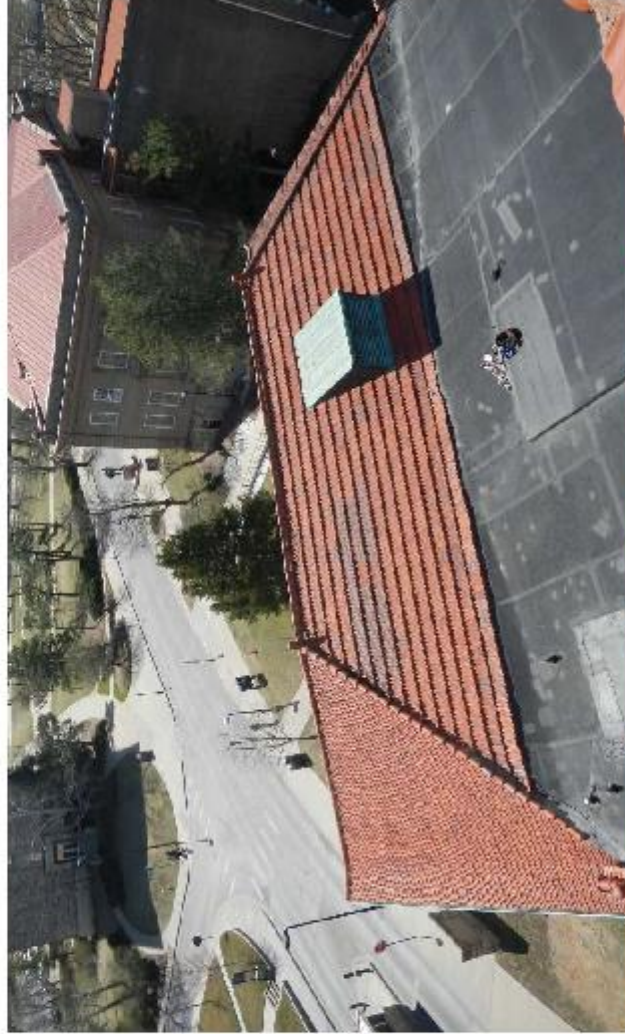


Appendix B – Executive Summary of Tile Roof and Exterior Wall Condition Assessment

out away from the wall. Based on inspection openings cut at the interior wall, this flashing is also leaking at joints with adjacent construction.

COLUMNS

The cast iron columns at the 7th floor support a portion of the primary roof framing. And though they appear to be in good condition from the ground, the paint coatings are deteriorating. The deterioration is particularly evident at the capitals and bases. Corrosion of the metal below is evident at all paint losses. Protective coatings on the columns are particularly important in



Flat roof and south hip roof viewed from the lower. Existing membrane roof has been patched in multiple locations and is failing to adhere in a large area around the base of the tower. Repairs to the tile roofs have utilized inappropriate materials and techniques at the hips and ridges. Replacement tiles used in previous repairs are mix of sizes resulting in improper filling and lapping in multiple locations. Battens used to secure the tiles are in variable condition, with locations of rot uncovered during the assessment.

protecting this element of the structure.

RECOMMENDATIONS

The following recommendations represent the minimum scope to improve the exterior envelope conditions that are most adversely affecting the 7th floor interior environment. Additional potential scopes are also identified. These scopes, while they increase the cost of the work, would provide an "upgrade" and may be beneficial to undertake if funding allows. Though the exterior repairs outlined will improve the interior conditions, they may not fully address occupant complaints. The exterior envelope is allowing some contaminants into the building, but it is also likely that some irritants are not linked to the building itself. Separating the collection and office spaces as part of the repairs is the only effective way to limit potential irritants from spreading between the collection and office spaces through the HVAC system. While this recommendation was rejected by building occupants in the previous study, it is still included as an optional scope of work in this study.

This exterior repair work package is envisioned with fixed scaffold in place. This is not only to facilitate access for the multiple trades involved but to alleviate access issues created by topography and landscaping around Dyche Hall. Costs for the

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minimum recommended repairs and the optional repairs are presented at the end of this section.

ROOF

Replacement of the north and south tile hip roofs and the flat roof between them is recommended. The high-profile red roof tile and accentuated ridges and hips are historic character defining features. The style of roof tile is still available and replacement roof tile should be new to achieve the full benefit of the expenditure. Ridges, hips and ornamental tiles should be salvaged for re-use where condition allows and replicated where it does not. This work would include redesign and replacement of the roof drainage to meet current sheet metal standards. Copper should be used for gutters and flashings that will be visible from the ground. Flashing and membrane termination at parapets, valleys and at the base of the tower should be redesigned to meet current sheet metal and roofing standards. PVC is recommended for the membrane replacement as it has a longer in service life expectancy than EPDM which is the current roofing. This will limit future disturbance of the tile where the different systems meet.

Replacement of rotten wood and thorough preparation and repainting of all wood members of the eaves, fascias and soffits should be performed while the gutters are out of the way.

Venting will need to be provided for the new hip roofs. Minimum venting provisions include venting each rafter space. This will require vents be placed under the high profile tiles, particularly along the hips, ridges, and at the tie in with the flat roof. Under the 2012 International Existing Building Code (IEBC) replacement of roof covering requires the installation of insulation per the International Energy Conservation Code (IECC). Insulation is recommended to reduce the HVAC loads on the 7th floor. However, given the number of thermal bridges present in the existing construction it will not likely be possible to fully meet the code required R-38. Air barriers are also part of current code requirements. Closed cell spray foam is recommended for both the high R value achieved per inch as well as the air barrier rating it is possible to achieve. However, as part of design, insulation studies including effective R value and vapor drive should be explored to determine the best course of action with the least risk of inadvertently trapping moisture in the roof assembly. Insulation should be applied to the top of the flat roof area.

Restoration of the original ceiling heights in the hip roof areas is also recommended. A single layer ceiling system will provide the thermal protection necessary for the insulation and roof framing and eliminate the need for multiple layers of sprinkler piping that the current arrangement requires. Ductwork can be run exposed in the finished spaces.

Optional scopes identified for the roof include replacement of all other tile roofs (the tower, pediments, entry and projecting bay) at the same time. These elements all suffer from the same or worse level of deterioration as was found at the main hip roofs.

This additional scope would place all of these roofs under one warranty held by one contractor. It would also ensure uniform aesthetic appearance.

WINDOWS

The minimum scope of work recommended for the windows is re-sealing the interior and exterior perimeter of the window unit, accompanied by resealing the panning trim to the stucco and sheet metal flashing. These seals are necessary to protect against air and water infiltration. Minor repairs, such as replacement of deteriorated weather stripping should also be performed.

The windows are nearing the end of their useful in service life. Replacement windows would need to meet the requirements of the 2012 IECC. These requirements are relatively new and not all windows currently on the market meet the more stringent standards. One optional scope of work would be to replace the windows on the 7th floor. But all of the windows in the original portion of the building appear to have been replaced at the same time. While a complete building window assessment was out of the scope many of the windows at lower floors were observed to have similar condition issues as those at the 7th floor. Waiting a few years to replace all the windows at once might be beneficial as more products should be available with better options to replicate the look of the historic windows.

WALLS AND FLASHING

Repointing mortar joints in brick and stone and replacing deteriorated stones is recommended to improve the performance



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The Roof and Exterior Wall Condition Assessment

University of Kansas
Dyche Hall

KU00000910364



Typical deterioration at the 7th floor east central facade. Note missing mortar joints and on wood trim at window sill. Mortar joints in the brick sill band and stone ledge are deteriorated and open in many locations. Central stone is delaminating due to excessive water infiltration which is a result of the long term underperformance of the gutter above. Bases of cast iron columns exhibit corrosion and paint loss.

of the walls at the 7th floor. To limit stone blistering and deterioration due to atmospheric soiling the soils should be removed. Biological (plant growth, mold, lichen and algae) soiling should be removed. Sky facing joints and other joints that are susceptible to infiltration (such as at the cast iron columns) should receive sealant capped with lead tees to extend the life of these difficult to maintain joints that are also difficult to see or inspect.

Sealant used at cracks in stucco is failing and should be removed. Cracks should be repaired with cementitious patches that are more compatible with the original material. The stucco should be sealed where it meets a dissimilar material such as metal window panning or stone.

The sheet metal flashing at the window sill should be stripped, repaired and re-coated. A drip with a kick should be added to further direct water away from wood trim and brick below. The wood trim should be replaced as necessary and properly repainted with a high performance coating.

Insulating the walls has been considered and is listed as an optional repair. This alteration carries with it some risk. The manner in which the wall is constructed on the 7th floor is unusual by any standard. The configuration will make installing insulation and an air barrier more difficult. The repair work on the exterior does not trigger a 2012 IEBC code requirement to provide insulation as it does with the roof so it is not a mandatory alteration. The studies recommended for roof insulation

Appendix B – Executive Summary of Tile Roof and Exterior Wall Condition Assessment

design are also recommended if the wall is to be insulated.

Optional scopes of work at the wall include thorough documentation of the grotesques using 3D laser scanning. This documentation is recommended to facilitate future replacement of these elements. Their fragile condition is such that restoration is unlikely. Further loss of material at the grotesques will make replication increasingly difficult. Removal of the grotesques is another optional work item. Intact removal without the prior documentation is not recommended due to the degree of deterioration and risk of breakage. Removal, if it can be accomplished in one piece, would prevent further deterioration and may allow stabilization of the pieces enough that they may be retained as important historic artifacts.

COLUMNS

The cast iron columns should be stripped and repainted with a high performance paint system to protect them from the elements. Deep corrosion or pitting should be repaired with fillers as part of the painting. Inspection for cracks or other signs of distress should also be made while paint coatings do not inhibit clear views of the substrate.

PROBABLE COSTS

For more detailed break down of costs please refer to Table 5 in the Recommendations section of this report. Costs presented in this report are for construction in 2016; inflation adjustments should be made for 2017 and beyond. For the minimum recommended scope of work construction costs are predicted to be just under \$2 million for:

- Replacement of tile and flat roofing; including venting, insulation, as well as eave, soffit, and ceiling restoration.
- Resealing window and panning perimeters, both interior and exterior.
- Repair of masonry wall surfaces, including stucco, brick, stone and mortar joint replacement
- Repair of sheet metal flashing at the window sill ledge and associated wood trim.
- Repair and repainting of cast iron columns.

Consideration should be given as to whether or not the project would benefit from undertaking all or some of the optional work. The total construction dollars for the optional work is predicted to be an additional \$1 to \$1.4 million if all optional work was undertaken and would include:

- Replacement of tile roofing at the pediments, entry, tower, and bay projection.
- Replacement of 7th floor windows
- Insulating and replacing the interior finish of the framed walls
- Documentation and removal of the grotesques
- Enclosure of the collection to separate it from the office spaces

The additional roof replacement represents the largest cost among the work listed. However, it is also most likely to be the highest benefit to the University in maintaining Dyche Hall and preventing more expensive repairs to brick, stone and uniquely carved elements in the future.



Appendix C – Historic Structure Report – Key Components

- Executive Summary
 - Including a description of the HSR as a long term management tool for managing Dyche Hall as a resource of historic significance to the University and to the State.
- Developmental History
 - Historical Background & Context
 - Analysis of Existing Conditions
 - Site & Landscape Evaluation
 - Architectural Description
 - Code & Accessibility Review
 - Structural Evaluation
 - Building System(s) Evaluation
 - Specialty Evaluations (i.e. – Panorama & Exhibit Spaces)
 - Condition Assessment & Materials Analyses
- Treatment & Use
 - Treatment Philosophy
 - Use & Interpretation of the Resource
 - Room/Feature Recommendations
 - Furnishings & Interior Decoration Recommendations
 - Prioritization and Cost Estimate
 - Maintenance Plan

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

Key to interpreting summary tables -

Building Elements

Refer to Figure 1 for identification of building façade and tower elements

Refer to Figure 2 for identification of building roof elements

Priority Ranking for Condition Repair

Refer to condition summary Tables for application of priority rankings

Refer to probable cost summary Table for recommended repairs for short, medium and long term

| | | Term | | | |
|--------------------|---|-------------|---------|---------|---------|
| | | Now | 1-3 yrs | 3-5 yrs | 5-10yrs |
| | | Immediate | Short | Med | Long |
| Life Safety | | | | | |
| 1a | Imminent hazard affecting primary entrances or circulation paths | x | x | | |
| 1b | Imminent hazard affecting minimally used areas or circulation paths | | | x | |
| 1c | Water infiltration affecting finish required as fire or smoke barrier | x | x | | |
| 1d | Potential hazard affecting circulation | | | x | |
| Water | | | | | |
| 2a | Water infiltration - actively damaging primary structural member | | x | | |
| 2b | Water infiltration - actively damaging secondary or tertiary structural member | | x | | |
| 2c | Water infiltration - actively damaging protective finish for structural member | | | x | |
| 2d | Water infiltration - affecting interior finishes or cladding | | | x | |
| 2e | Water infiltration - affecting exterior finishes or cladding | | | x | |
| Air | | | | | |
| 3a | Improper venting | | x | | |
| 3b | Air infiltration affecting building conditioning | | x | | |
| Aesthetic | | | | | |
| 4a | Aesthetic - major or significant character defining feature | | x | | |
| 4b | Aesthetic - character defining feature | | | x | |
| 4c | Aesthetic - non-character defining feature | | | | x |
| ID codes | | | | | |
| XX-X | First character denotes direction or wing of the building, i.e.: North, South, Tower | | | | |
| XX-X | Second character denotes building component, i.e.: Roof, Façade | | | | |
| XX-X | Third character is numerical identifier to differentiate conditions associated with the same building component | | | | |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|----------------------------------|---------------|--|--|----------|
| South Hip | | | | |
| Attic | | | | |
| SR-1 | Rafters | good condition, hips in particular exhibit some water staining, but not was not observed | retain | n/a |
| SR-2 | Decking | good to fair in most locations, limited areas of rot/dry rot adjacent to leaks | replace rotted sections with material in kind when roofing is repaired | 2b |
| SR-3 | Venting | no provision for venting at ridge, hip or eaves; north eave has been closed off due to roof alteration | as part of re-roof design and install code compliant vents | 3a |
| SR-4 | Insulation | modest layer of insulation present above suspended ceiling installed in 1949 and does not provide recommended R value | consider inclusion of insulation with venting (would require interior changes as well) | 3b |
| Tile Roofing | | | | |
| SR-5 | Ridges & hips | western hip tiles have been previously replaced, eastern hips retain original bugle hip tile; all hips are leaking, inappropriate mortar, sealant and roof cement repairs are capturing water and directing it under the tiles; ridge tiles have been repaired in similar fashion as hips and direct water under the tile | remove and replace hip tiles with new, salvage and re-install ridge tile and terminals | 2a |
| SR-6 | Field tile | significant replacements on the north face and all of the west has been replaced; many tiles exhibiting spalling - end of useful service life; not all replacement tile fits well and may allow infiltration under adverse weather conditions; some new tiles are inappropriate for installation on batten and exhibit manufacturing defect; underlayment is variable in age, material and condition | remove and replace field tiles with new | 2e |
| SR-7 | Dormer vent | holes in roof of vent from previous fall protection anchor installation; vent allows moisture into rafter and attic space | repair holes; install interior evaporation gutter to catch and contain blowing rain and snow; close off or consider removing/repurposing as part of proper venting installation | 2d |
| Gutters & Roof Drains | | | | |
| SR-8 | Gutters | copper gutter on the west has been replaced and does not match historic; historic gutters are deteriorated and leaking; east and west gutters have multiple two fixed points (expansion and contraction problem); east and west gutter capacity may not be sufficient due to roof alterations; | replace gutters when roofing is replaced, ensure sizing and weight are appropriate for capacity, girth and distance between expansion joints as well as the location of fixed points (corners and roof drains) between joints. | 2e |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|----------------------------------|---------------|--|--|----------|
| South Hip | | | | |
| Attic | | | | |
| SR-1 | Rafters | good condition, hips in particular exhibit some water staining, but not was not observed | retain | n/a |
| SR-2 | Decking | good to fair in most locations, limited areas of rot/dry rot adjacent to leaks | replace rotted sections with material in kind when roofing is repaired | 2b |
| SR-3 | Venting | no provision for venting at ridge, hip or eaves; north eave has been closed off due to roof alteration | as part of re-roof design and install code compliant vents | 3a |
| SR-4 | Insulation | modest layer of insulation present above suspended ceiling installed in 1949 and does not provide recommended R value | consider inclusion of insulation with venting (would require interior changes as well) | 3b |
| Tile Roofing | | | | |
| SR-5 | Ridges & hips | western hip tiles have been previously replaced, eastern hips retain original bugle hip tile; all hips are leaking, inappropriate mortar, sealant and roof cement repairs are capturing water and directing it under the tiles; ridge tiles have been repaired in similar fashion as hips and direct water under the tile | remove and replace hip tiles with new, salvage and reinstall ridge tile and terminals | 2a |
| SR-6 | Field tile | significant replacements on the north face and all of the west has been replaced; many tiles exhibiting spalling - end of useful service life; not all replacement tile fits well and may allow infiltration under adverse weather conditions; some new tiles are inappropriate for installation on batten and exhibit manufacturing defect; underlayment is variable in age, material and condition | remove and replace field tiles with new | 2e |
| SR-7 | Dormer vent | holes in roof of vent from previous fall protection anchor installation; vent allows moisture into rafter and attic space | repair holes; install interior evaporation gutter to catch and contain blowing rain and snow; close off or consider removing/repurposing as part of proper venting installation | 2d |
| Gutters & Roof Drains | | | | |
| SR-8 | Gutters | copper gutter on the west has been replaced and does not match historic; historic gutters are deteriorated and leaking; east and west gutters have multiple two fixed points (expansion and contraction problem); east and west gutter capacity may not be sufficient due to roof alterations; | replace gutters when roofing is replaced, ensure sizing and weight are appropriate for capacity, girth and distance between expansion joints as well as the location of fixed points (corners and roof drains) between joints. | 2e |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---------------------|---------------|--|---|----------|
| SR-9 | Roof Drains | all down spouts appear to be original; east side downspout is very likely undersized due to roof alterations which have nearly doubled the volume expected in this drain; west side may also be undersized for current volume; south drain, while not likely undersized serves as a gutter length that far exceeds design recommendations for overall gutter length between expansion joints | as part of gutter replacement evaluate the number and location of roof drains and adjust to follow standard sheet metal design guides and increase the number as appropriate | 2e |
| North Hip | | | | |
| Tile Roofing | | | | |
| NR-1 | Ridges & hips | western hip tiles have been previously replaced, eastern hips retain original bugle hip tile; all hips exhibit inappropriate mortar, sealant and roof cement repairs are capturing water and directing it under the tiles; ridge tiles have been repaired in similar fashion as hips and direct water under the tile, while direct observation was not possible in this attic, the conditions are similar to the south and likely all the hips are leaking | remove and replace hip tiles with new; salvage and reinstall ridge tile and terminals | 2a |
| NR-2 | Field tile | multiple types of replacement tile have been used, not all fit properly; new tile with manufacturing defect found on this hip; many tiles have been caulked together or improperly repaired; cracked and broken tiles; underlayment is variable in age, material and condition; battens on east hip face near the tower are deteriorating | remove and replace field tiles with new | 2e |
| NR-3 | Dormer vent | copper cladding exhibits small punctures in copper from tool and/or storm damage; vent allows moisture, rain and snow into rafter and attic space above plaster under certain environmental condition | repair holes; install interior evaporation gutter to catch and contain blowing rain and snow; close off or consider removing/repurposing as part of proper venting installation | 2d |
| NR-4 | Venting | no provision for venting at ridge, hip or eaves; north and south eave has been closed off due to addition and roof alteration | as part of re-roof design and install code compliant vents | 3a |
| NR-5 | Insulation | modest layer of insulation present above suspended ceiling installed in 1949 and does not provide recommended R value | consider inclusion of insulation with venting (would require interior changes as well) | 3b |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--|---------------------------------|---|---|----------|
| Gutters & Roof Drains | | | | |
| NR-6 | Gutter | copper gutter on the west has been replaced and does not match hisbil; historic gutters are deteriorated and leaking; north gutter joined to east gutter (thru expansion joint) when addition was constructed; east and west gutters have multiple two fixed points (expansion and contraction problem); west gutter capacity may not be sufficient due to roof alterations; fasteners used to hang or repair gutters are frequently not of compatible metals | replace gutters when roofing is replaced, ensure sizing and weight are appropriate for capacity, girth and distance between expansion joints as well as the location of fixed points (corners and roof drains) between joints. | 2e |
| NR-7 | Roof Drains | all down spouts appear to be original; west side may also be undersized for current volume | as part of gutter replacement evaluate the number and location of roof drains and adjust to follow standard sheet metal design guides and increase the number as appropriate | 2e |
| <i>Additional areas observed as time permitted/access or views available</i> | | | | |
| NR-8 | Flat roof tie to north addition | roof drains missing debris screens | replace screens | 2e |
| Flat Roof | | | | |
| EPDM | | | | |
| CR-1 | General | roof membrane is unadhered in a large area near the tower base; roof membrane has multiple patches (damage from OG microburst) | replace | 2a |
| CR-2 | Termination at tower base | membrane is turned up less than 4" and finished with a termination bar and multiple layers of sealant to uneven rock face stone; from chase north of women's restroom evidence of water infiltration and damage to wood framing can be seen | provide cant at wall to ease transition up the wall, increase turn up to 8", dress stone to provide sound surface for sealing; cut reglet at 12" above roof and install metal counter flashing (stainless or copper) to cover and protect top of EPDM | 2a |
| CR-3 | Tile termination | membrane is turned up under tile but not properly lapped into tile underlayment; battens for tiles over the membrane lack counter battens or shims and allow water to accumulate and deteriorate the batten | re-design detail for proper transition with roofing replacement | 2d |
| CR-4 | Parapet terminations | membrane is turned up less than 4" and finished with a termination bar and multiple layers of sealant to uneven rock face stone | to the extent that the parapet height allows, provide termination as described for tower | 2a |
| Accessories | | | | |
| CR-5 | Scuttle | metal roof hatch with hold open appears relatively new; operates well; no apparent leaks | retain | n/a |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--|----------------------|--|---|----------|
| CR-6 | Lightning protection | lightning protection leaders come down from the tower, indicating air terminals located on the tower; terminals on tile and flat roof and several roof mounted items; several air terminals are lying on the roof and no longer mounted; newer equipment (package unit, vent at west central parapet) lack air terminals | contact design and installation contractor for repairs and alterations to meet current roof configuration and equipment to ensure protection from lightning strikes | 1b |
| Gutters & Roof Drains | | | | |
| CR-7 | Gutter | west gutters have been replaced but do not match historic; fasteners are not compatible; east gutter is very shallow and likely undersized for the expected volume of water due to roof alterations; east gutter is clogged with ferrous sheet metal that exhibits severe corrosion and perforations | replace gutters when roofing is replaced, ensure sizing and weight are appropriate for capacity, girth and distance between expansion joints as well as the location of fixed points (corners and roof drains) between joints. | 2e |
| CR-8 | Roof drains | all roof drains drain into gutters on the north and south hips | as part of gutter replacement evaluate the number and location of roof drains and adjust to follow standard sheet metal design guides and increase the number as appropriate | 2e |
| Masonry | | | | |
| CR-9 | Parapets | all parapets show significant deterioration; tile copings on parapets are mortar set; cracked tiles and mortar failure are typical | evaluate parapets for any necessary code required reinforcement and implement repairs; repoint masonry including below the flashing/counter flashing lines; dress or replace damaged masonry units to provide sound surface for sealants and anchors; remove tile, salvage decorative pieces for reuse; replace tile over thru wall stainless or copper flashings | 2b |
| CR-10 | Tower | stone is in fair to good condition, with some spalling and loss, no reglets or appropriate step flashings are present | repoint masonry to a minimum of 5', including pointing in areas below and behind base and counter flashings; dress or replace faces of damaged units to provide sound stone for sealant and fasteners | 2b |
| Additional areas observed as time permitted/access or views available | | | | |
| PR-1 | Panorama roof | synthetic slate is streaked and fading; missing shingle on north slope near the hip | replace missing shingle | 2e |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---|----------------------------------|--|---|----------|
| Tower | | | | |
| Tile Roofing, Including Pediments | | | | |
| TR-1 | Tower roof | no signs of leaks evident in wood ceiling, but condition of masonry walls indicates that the system is taking on water and transferring it to the masonry walls below | remove and replace tile, underlayment and flashings, similar to other roofs, install access hatch for future monitoring of roof framing | 2a |
| TR-2 | Pediments | broken tiles, inappropriate repairs | remove tile; re-install with flashing to limit water entering masonry structure below | 2a |
| TR-3 | Shed roofs | broken tiles, inappropriate repairs, vegetation growth | remove tile; re-install with flashing to limit water entering masonry structure below | 2a |
| Observation level Roofing & Deck | | | | |
| TR-4 | Sheet metal roofing/walking deck | metal has been painted multiple times and coated - active leaks below this level noted at the northwest and north sides | coating removal for evaluation of leak areas to determine extent of damage; potential replacement | 2a |
| TR-5 | Wood deck | soft spots in deck were not observed from above; from below wood deck extends under octagonal walls exhibits rot/dry rot | address roofing, flashing and masonry above for water infiltration issues; evaluate potential replacement | 2b |
| TR-6 | Steel beams | significant corrosion noted on western north-south beam and northern east-west beam; moderate corrosion noted on remaining two beams | repair roofing and flashing above; remove corrosion to determine loss of section, potential structural repair | 2a |
| Masonry | | | | |
| TR-7 | Observation deck level | masonry viewed from this level is deteriorated, delamination failures, previous repointing was not compacted and is eroding and falling; pronounced horizontal crack on the west and east walls of the tower coinciding with metal ties shown in original construction documents indicating potential significant moisture in the wall, previous parging on the interior side of the wall. | remove parging; evaluate existing anchors for condition and necessity; structural repair may be necessary; replace damaged masonry units, repoint with appropriate mortar | 2a |
| TR-8 | Stone and brick walls | exterior joints are likely similar to those observed elsewhere; interior has been roughly parged in several locations and painted, some paint deterioration, units in good to fair condition | repoint with appropriate mortar; replace damaged units | 2e |

Appendix D– Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--------------------|-----------------|--|--|----------|
| East Facade | | | | |
| <i>Masonry</i> | | | | |
| EF-1 | Stone piers | mortar joints previously repaired inappropriately, shrinkage cracks, sealant; open joints; units in fair to good condition; most deterioration and staining (bio and copper) is at pier between south hip and arcade bay; biological staining at north is mild to moderate | repoint all joints, remove sealant; dress or replace severely damaged units; clean with biocide | 2e |
| EF-2 | Brick sill band | open and deteriorating joints in over 50% of this area; some inappropriate repairs with sealant; joint with sill stone is typically very deteriorated accompanied by biological stains; joint with cast iron columns is also typically deteriorated | repoint all joints, remove sealant; consider installing lead cap in joint with stone to increase the durability of the joint; similar consideration at cast iron columns | 2b |
| EF-3 | Stucco | stucco is likely applied over plaster boards (similar to that found on the interior of the wall); fairly regular pattern of cracks is discernable (similar to interior) though there are some diagonal and counter to it; sealant applied in some locations | sample and test for likely mix to determine if part of cracking issue; repair cracks; consider skim coat in badly cracked areas | 2e |
| EF-4 | Stone sill | fine delamination and cracking along top or bottom visible on half of stones; select stones are in very poor condition one is undermining bearing plate for cast iron column (at the arcade bay), mortar joints are in poor condition with variable previous repairs; some evidence of plant growth in these joints (north in particular); atmospheric (likely gypsum) crusting on the bottom, limited areas of blistering | replace severely damaged stones; repair damaged stones; repoint all joints, consider lead cap in skyward facing joints to increase durability of joint; clean stone | 2a/2e |
| EF-5 | Stone corbels | corbel units are in good condition overall, but the head joint is typically fully open or partially open; atmospheric staining (likely gypsum) | joints should be pointed, but only as part of comprehensive repairs to areas above; clean stone | 2e |
| EF-6 | Stone pediment | moderate deterioration in stone under areas of failing tile; losses at spout blocks are typical, as are cracks and biological staining; plinths under grotesques typically exhibit fine cracks and delamination | repair stones with dressing and/or patching, but only associated with repairs to tile | 2a/4a |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--|---|---|--|----------|
| EF-7 | Grotesques | stones are edge bedded and exhibiting delamination; moderate to severe deterioration in all four on this face; most have lost detail, tooling or pieces of stone; some more losses are small but imminent; inappropriate previous repairs at delamination cracks with silicone sealant; biological staining is more prevalent on the north side (vegetation in the vicinity); | plan for replacement; these elements should be documented prior to continuing loss (3-D laser scanning); each creature is unique and continued loss makes replication increasingly difficult | 4a |
| EF-8 | Brick & stucco mosaic and blocks | original stucco texture is a two or three coat application and is fairly well preserved at the corbel level, but more exposed areas in the band and in the blocks exhibit significant to total losses of finish (70% of areas); building may have been cleaned too aggressively in the past; exposed brick joints have been caulked | sample and test for likely mix to determine if composition is part of reason for losses; repoint exposed joints; restore areas of loss | 2e |
| <i>Additional areas observed as time permitted/access or views available</i> | | | | |
| EE-1 | Entry cornices | eroded with some cracks and loss of detail | repair roof above entry as deslbed; repair damaged stones; repoint | 4a |
| EE-2 | Entry walls (native stone) | stone in upper wall directly below the cornice is fractured and exhibiting freeze thaw damage both sides of the rake | repair roof above entry as deslbed; replace damaged stones; repoint | 2a |
| EE-3 | Entry walls and ornament (cut and carved stone) | stones on the north side exhibit cracks, loss and delamination due to water washing over them, including the label molding of the arch and the carved lion's head above the columns | repair roof above entry to halt water washing over this area; document carved stones with 3-D laser scanning; repair stone | 4a |
| EE-4 | Entry stairs | horizontal cracks from freeze thaw and salt use; steps are out of level in some locations, bottom of landing slab is damp; supporting steel beams appear to be newer; sealant joints are deteriorated | replace damaged stones; reset steps; metal beam bearing should be investigated and evaluated for potential damage due to infiltration related corrosion; repoint | |
| EE-5 | Entry cheek walls | stone is cracked and fractured from freeze thaw and salt uptake; voussoir in arch on north has lost lower portion of stone; drainage from entry landing does not appear to be adequate | replace damaged stones; stone repairs will only be effective if entry stairs and landing drainage is adequately repaired; repoint | 2b |
| EE-6 | Entry wing walls | stone is cracked and fractured from freeze thaw and salt uptake; sealant joints at adjacent walk are deteriorated | replace damaged stones; stone repairs will only be effective if entry stairs and landing drainage is adequately repaired; repoint | 4b |
| EE-7 | Lower entry walls | stone is cracked and fractured from freeze thaw and salt uptake; severe efflorescence on visible side of wall, some stone replacement near beams appears recent | replace damaged stones; stone repairs will only be effective if entry stairs and landing drainage is adequately repaired | 2b |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---|-----------------------|--|---|----------|
| Ferrous Metals | | | | |
| EF-9 | Cast iron columns | loss of paint in details at capitals and and at base plate is typical, all paint losses are associated with visible mild to moderate corrosion | thoroughly prep and paint with high performance coating | 2c |
| Wood and Windows | | | | |
| EF-10 | Fascia | significant paint loss and rot/dry rot are typical; where paint is adhered several layers are evident; in areas of peeling paint it appears only one coat was applied and perhaps without primer; deterioration in this location is associated with water infiltration - see gutter notes | replace rotted wood, prep and prime all exposed surfaces and provide two layers of high quality paint; repairs should be in conjunction with gutter replacement to be effective | 2e |
| EF-11 | Soffit | limited areas of paint loss, primarily outboard of the box beam | prep and paint | 2e |
| EF-12 | Box beam | limited areas of paint loss | prep and paint | 4b |
| EF-13 | Soffit blocks | limited areas of paint loss | prep and paint | 4b |
| EF-14 | Soffit brackets | paint loss is typical on these elements, they tend to catch water passing over the fascia and pull it back along their length | prep and paint | 4b |
| EF-15 | Window sill band | partial or complete paint loss is typical, some rot/dry rot | replace rotted wood, prep and paint | 2e |
| EF-16 | Windows (replacement) | one window unit was observed with a dropped upper sash, occupants report great difficulty in operation, some glazing units have lost their seal (decreased thermal performance); perimeter sealant is a lagatoring and typically exhibits adhesive failure along one or both edges | remove and replace sealant; consider window replacement | 2e/3b |
| EF-17 | Window panning | metal window panning is in good condition, but was observed to be too short in many locations to cover the wood beneath it; where wood was exposed it was typically end grain and lacked any paint coating for protection; sealant between panning and stucco exhibited similar, but less pronounced deterioration as window units | coat and/or cover exposed wood trim; remove and replace sealant; replace when window units are replaced | 2e |
| Gutters, Tile, and Sheet Metal Flashings - for roof tile, see roof | | | | |
| | Copper gutter | see roof condition assessment | | |
| EF-18 | Sill flashing | painted ferrous metal flashing; paint is peeling and chalking over most of surface; front edge lacks a drip with a kick and allows water to drain over wood trim below; | remove paint, repair joints, add a drip with kick at front, prep and repaint with high performance coating | 4b |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--------------------|----------------------------------|---|---|----------|
| SF-19 | Pediment tile | cracked and missing pieces of tile observed; woody plant growth at the north pediment; inappropriate mortar cant used at wall; mortar piled up over ridge caps directing water under tile; tiles are mortar set over stone | salvage ridge and ornament; replace field tiles over stainless steel flashing | 2e |
| West Façade | | | | |
| Masonry | | | | |
| WF-1 | Stone piers | mortar joints previously repaired inappropriately; shrinkage cracks; sealant; open joints; units in fair to good condition | repoint all joints, remove sealant; dress or replace severely damaged units | 2e |
| WF-2 | Brick sill band | open and deteriorating joints in over 50% of this area; some inappropriate repairs with sealant; joint with sill stone is typically very deteriorated accompanied by biological stains; joint with cast iron columns is also typically deteriorated | repoint all joints, remove sealant; consider installing lead cap in joint with stone to increase the durability of the joint; similar consideration at cast iron columns | 2b |
| WF-3 | Stucco | stucco is likely applied over plaster boards (similar to that found on the interior of the wall); fairly regular pattern of cracks is discernable (similar to interior) though there are some diagonal and counter to it; sealant applied in some locations | sample and test for likely mix to determine if part of cracking issue; repair cracks; consider skim coat in badly cracked areas | 2e |
| WF-4 | Stone sill | fine delamination and cracking along top or bottom visible on most stones, loss at stone on SW corner; mortar joints are in poor condition with variable previous repairs; atmospheric (likely gypsum) crusting on the bottom, limited areas of blistering | replace stones with severe delamination; repair damaged stones; repoint all joints, consider lead cap in skyward facing joints to increase durability of joint; clean stone | 2e |
| WF-5 | Stone corbels | corbel units are in good condition overall, but the head joint is typically fully open or partially open; atmospheric staining (likely gypsum) | joints should be pointed, but only as part of comprehensive repairs to areas above; clean stone | 2e |
| WF-6 | Stone pediment | moderate deterioration in stone under areas of failing tile; losses at spout blocks are typical, as are cracks and biological staining; plinths under grotesques typically exhibit fine cracks and delamination | repair stones with dressing and/or patching, but only associated with repairs to tile | 2e/4a |
| WF-7 | Brick & stucco mosaic and blocks | original stucco texture is a two or three coat application and is fairly well preserved at the corbel level, but more exposed areas in the band and in the blocks exhibit significant to total losses of finish (70% of areas); building may have been cleaned too aggressively in the past; exposed brick joints have been caulked | sample and test for likely mix to determine if composition is part of reason for losses; repoint exposed joints; restore areas of loss | 2e |

Appendix D– Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|-----------------------|----------------------------------|---|--|----------|
| SF-4 | Stone sill | fine delamination and cracking along top or bottom visible on most stones; several stones between the pediments are set such that they drain back to the brick sill band; mortar joints are in poor condition with variable previous repairs; some evidence of plant growth in these joints (west in particular); atmospheric (likely gypsum) crusting on the bottom, limited areas of blistering | replace stones with severe delamination; repair damaged stones; repoint all joints, consider lead cap in skyward facing joints to increase durability of joint; clean stone | 2e |
| SF-5 | Stone corbels | corbel units are in good condition overall, but the head joint is typically fully open or partially open; atmospheric staining (likely gypsum) | joints should be pointed, but only as part of comprehensive repairs to areas above; clean stone | 2e |
| SF-6 | Stone pediment | moderate deterioration in stone under areas of falling tile; losses at spout blocks are typical, as are cracks and biological staining; plinths under grotesques typically exhibit fine cracks and delamination; western side of east pediment deterioration extends down to bottom of paired columns (gutter leak above) | repair stones with dressing and/or patching, but only associated with repairs to tile | 2e/4a |
| SF-7 | Grotesques | stones are edge bedded and exhibiting delamination; moderate to severe deterioration in all four on this face, western most creature is in very poor condition; most have lost detail, tooling or pieces of stone, some more losses are small but imminent; inappropriate previous repairs at delamination cracks with silicone sealant; moderate biological staining | plan for replacement; these elements should be documented prior to continuing loss (3-D laser scanning), each creature is unique and continued loss makes replication increasingly difficult | 4a |
| SF-8 | Brick & stucco mosaic and blocks | original stucco texture is a two or three coat application and is fairly well preserved at the corbel level, but more exposed areas in the band and in the blocks exhibit significant to total losses of finish (70% of areas); building may have been cleaned too aggressively in the past; exposed brick joints have been caulked | sample and test for likely mix to determine if composition is part of reason for losses; repoint exposed joints; restore areas of loss | 2e |
| Ferrous Metals | | | | |
| SF-9 | Cast iron columns | loss of paint in details at capitals and and at base plate is typical, all paint losses are associated with visible mild to moderate corrosion | thoroughly prep and paint with high performance coating | 2c |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|--|--------------------------------|--|--|----------|
| EF-19 | Pediment tile | cracked and missing pieces of tile observed; woody plant growth at the north pediment; inappropriate mortar cant used at wall; mortar piled up over ridge caps directing water under tile; tiles are mortar set over stone | salvage ridge and ornament; replace field tiles over stainless steel flashing | 2e |
| EB-1 | Bay roof tile | very poor condition; cracked and missing tile; inappropriate use of mortar as flashing at wall; mortar, sealant and roof cement built up over hip tiles direct water under the tiles; ridge tiles are sealed to sill stone with roof cement | salvage ridge and ornament; replace field tiles over stainless steel flashing; reconfigure flashing and tile in at sill stone | 2e/2d |
| <i>Additional areas observed as time permitted/access or views available</i> | | | | |
| EE-8 | Entry roof tile | very poor condition; cracked and missing tile; inappropriate use of mortar as flashing at wall; mortar, sealant and roof cement built up over hip tiles direct water under the tiles; tie in with membrane roof behind tile band appears to be major source of infiltration | salvage ridge and ornament; replace field tiles over stainless steel flashing; reconfigure flashing and tile in to membrane roof area | 2e |
| EE-9 | Entry roof membrane & drainage | membrane roof concealed by tile front exhibits several areas of repairs; drainage is poor and path is blocked with debris (bits of masonry, leaf litter, etc) | remove membrane, evaluate roof decking for replacement and replace roofing; reconfigure tie in with tile; improve drainage from this area if possible | 2e |
| South Façade | | | | |
| Masonry | | | | |
| SF-1 | Stone plens | mortar joints previously repaired inappropriately, shrinkage cracks, sealant; open joints; units in fair to good condition | repoint all joints, remove sealant; dress or replace severely damaged units | 2e |
| SF-2 | Brick sillband | open and deteriorating joints in over 50% of this area; some inappropriate repairs with sealant; joint with sill stone is typically very deteriorated accompanied by biological stains; joint with cast iron columns is also typically deteriorated; light visible from inside (at inspection opening) | repoint all joints, remove sealant; consider installing lead cap in joint with stone to increase the durability of the joint; similar consideration at cast iron columns | 2b |
| SF-3 | Stucco | stucco is likely applied over plaster boards (similar to that found on the interior of the wall); fairly regular pattern of cracks is discernable (similar to interior) though there are some diagonal and counter to it; sealant applied in some locations | sample and test for likely mix to determine if part of cracking issue; repair cracks; consider skim coat in badly cracked areas | 2e |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---|-----------------------|---|---|----------|
| Wood and Windows | | | | |
| SF-10 | Fascia | significant paint loss and rot/dry rot are typical; where paint is adhered several layers are evident; in areas of peeling paint it appears only one coat was applied and perhaps without primer; deterioration in this location is associated with water infiltration - see gutter notes | replace rotted wood, prep and prime all exposed surfaces and provide two layers of high quality paint; repairs should be in conjunction with gutter replacement to be effective | 2e |
| SF-11 | Soffit | limited areas of paint loss, primarily outboard of the box beam | prep and paint | 2e |
| SF-12 | Box beam | limited areas of paint loss | prep and paint | 4b |
| SF-13 | Soffit blocks | limited areas of paint loss; one block has dropped and been secured in place with a long screw | prep and paint; remove and reset dropped block | 4b |
| SF-14 | Soffit brackets | paint loss is typical on these elements, they tend to catch water passing over the fascia and pull it back along their length | prep and paint | 4b |
| SF-15 | Window sill band | partial or complete paint loss is typical, some rot/dry rot, particularly pronounced at location dehumidifier has been dumping water out a window | replace rotted wood, prep and paint | 2e |
| SF-16 | Windows (replacement) | occupants report great difficulty in operation, some glazing units have lost their seal (decreased thermal performance); perimeter sealant is alligatoring and typically exhibits adhesive failure along one or both edges | remove and replace sealant; consider window replacement | 2e/3b |
| SF-17 | Window panning | metal window panning is in good condition, but was observed to be too short in many locations to cover the wood beneath it; where wood was exposed it was typically end grain and lacked any paint coating for protection; sealant between panning and stubs exhibited similar, but less pronounced deterioration as window units | coat and/or cover exposed wood trim; remove and replace sealant; replace when window units are replaced | 2e |
| Gutters, Tile, and Sheet Metal Flashings - for roof tile, see roof | | | | |
| | Copper gutter | see roof condition notes | | |
| SF-18 | Sill flashing | painted ferrous metal flashing; paint is peeling and chalking over most of surface, especially pronounced where water from dehumidifier has been dumped out the window; front edge lacks a drip with a kick and allows water to drain over wood trim below | remove paint, repair joints, add a drip with kick at front, prep and repaint with high performance coating | 2e/4b |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---|-----------------------|--|---|----------|
| Ferrous Metals | | | | |
| WF-8 | Cast iron columns | loss of paint in details at capitals and and at base plate is typical, all paint losses are associated with visible mild to moderate corrosion | thoroughly prep and paint with high performance coating | 2c |
| Wood and Windows | | | | |
| WF-9 | Fasda | significant paint loss and rot/dry rot are typical; where paint is adhered several layers are evident; deterioration in this location is associated with water infiltration - see gutter notes | replace rotted wood, prep and prime all exposed surfaces and provide two layers of high quality paint; repairs should be in conjunction with gutter replacement to be effective | 2e |
| WF-10 | Soffit | limited areas of paint loss; primarily outboard of the box beam | prep and paint | 2e |
| WF-11 | Box beam | limited areas of paint loss | prep and paint | 4b |
| WF-12 | Brackets | limited areas of paint loss | prep and paint | 4b |
| WF-13 | Window sill band | partial or complete paint loss is typical, some rot/dry rot | replace rotted wood, prep and paint | 2e |
| WF-14 | Windows (replacement) | occupants report great difficulty in operation, some glazing units have lost their seal (decreased thermal performance); perimeter sealant is algalting and typically exhibits adhesive failure along one or both edges | remove and replace sealant; consider window replacement | 2e/3b |
| WF-15 | Window panning | metal window panning is in good condition, but was observed to be too short in many locations to cover the wood beneath it; where wood was exposed it was typically end grain and lacked any paint coating for protection; sealant between panning and stucco exhibited similar, but less pronounced deterioration as window units | coat and/or cover exposed wood trim; remove and replace sealant; replace when window units are replaced | 2e |
| Gutters, Tile, and Sheet Metal Flashings - for roof tile, see roof | | | | |
| see roof condition notes | | | | |
| WF-16 | Copper gutter | painted ferrous metal flashing; paint is peeling and chalking over most of surface; front edge lacks a drip with a kick and allows water to drain over wood trim below; | remove paint, repair joints, add a drip with kick at front, prep and repaint with high performance coating | 4b |
| WF-17 | Sill flashing | cracked and missing pieces of tile observed; inappropriate mortar cant used at wall and at intermediate tile joints; mortar piled up over ridge caps directing water under tile; tiles are mortar set over stone | salvage ridge and ornament; replace field tiles over stainless steel flashing | 2e |

Appendix D – Tile Roof & Exterior Wall Condition Summary Tables

| ID | Element | Condition | Recommendation | Priority |
|---|---------------------------------|--|-----------------|----------|
| Additional areas observed as time permitted/access or views available PR-2 | Step flashing at panoramic wing | step flashing has been pulled away from wall | adjust flashing | 2b |